

REMARKS

The application has been amended.

The specification has been amended as suggested by the Official Action.

Claims 1-4 stand rejected under section 112, first and second paragraphs.

The basis for these rejections appears to be a question concerning the meaning of the recitation "without pause".

No amendment is believed necessary, as this recitation is believed clear to one of skill having read and understood the originally filed application. The recitation is explained below in context with the anticipation rejection.

Reconsideration and withdrawal of these rejections are respectfully requested.

Claims 1-4 stand rejected as anticipated by KUSAKABE 5,105,700.

The Official Action refers to Figure 5, but there is no Figure 5.

The anticipation rejection is not believed to be viable for at least the reasons that follow.

KUSAKABE does not appear to disclose any means for activating impose on the cutting slide an alternating linear motion with no pauses following a law of motion in which acceleration is a derivable function.

Please refer to Figure 2 of the application, reproduced below.

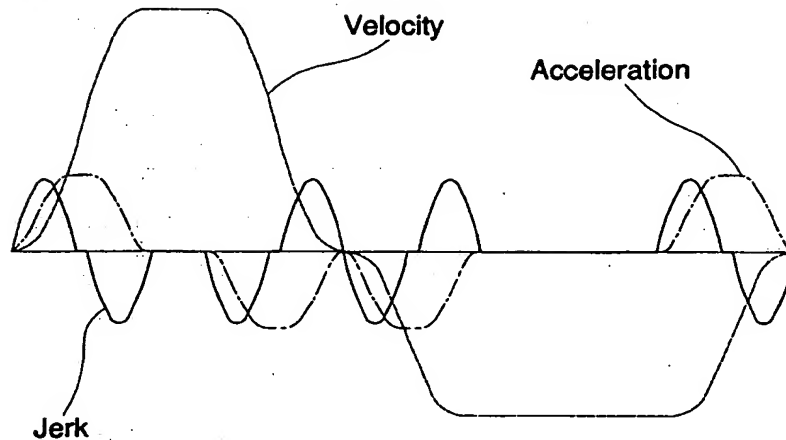


Fig. 2

Figure 2 shows *sample graphs relating to time/velocity, acceleration and jerk*. The above "means for activating" recitations relate to the *law of motion imposed on the cutting slide* which is as follows:

1) *an alternating linear motion with no pauses*, i.e., there are no finite times ( $\Delta t = t_2 - t_1 \neq 0$ ) when the velocity  $V(t)$  is zero, but only instants  $t$  (for which  $t_1 = t_2$  and  $\Delta t = 0$ ) where there is an inversion of the direction of motion.

As can be seen in the diagram of the velocities in function of the times (represented on the x-coordinates in Figure 2), the diagram or curve of the velocities  $V(t)$  [represented in Figure 2 by the curve with equal-length dashes] intersects the axis of the times (presented by single dots). In other words, the

time periods (or pause) in which the velocity  $V(t)$  is zero are single instants, whose duration  $\Delta t = 0$ , and not finite intervals with duration  $\Delta t \neq 0$ .

The phrase **without pausing** means "without pausing" which is to say those instants whose velocity  $V(t)$  is zero in that outward and return cycles having a duration which is zero.

The second **law of motion** furthermore states that:

2) **acceleration is a derivable function** which means that the diagram (or curve) of the acceleration in function of time  $a(t)$  [having the dash-dot curve in Figure 2] is characterized by admitting of only one tangent at each point thereof; this diagram or curve  $a(t)$  does not present any cusps. This characteristic of the acceleration  $a(t)$  minimizes errors of position and velocity of the slide (2) with respect to the tube (10).

Without KUSAKABE disclosing the recited means for activating impose on the cutting slide an alternating linear motion with no pauses following a law of motion in which acceleration is a derivable function, there is no anticipation.

Accordingly, reconsideration and allowance of all the claims are respectfully requested.

As to the question of enablement, applicant believes that one of skill could make and use the invention, based on the ordinary level of skill within the art taken together with the application's disclosure.

See the published application paragraph [0014] teaches concept to limit the bumps and vibrations on the machine and the transmission system in particular, the accelerations the moving parts are subjected to have to be limited, and especially brusque or jerky accelerations have to be avoided. In the law of motion imposed on the slide acceleration is a derivable function and the derivation, i.e., the jerk, is in fact a continuous process. Advantageously, the motion imposed on the cutting slide 2 includes a velocity profile on the basis of which the passages from the acceleration tracts to the constant velocity tracts and thence to the deceleration tracts connect with sinusoidal curves. In a further embodiment a similar motion imposed on the cutting slide 2 includes a velocity profile on the basis of which the passages from the acceleration tracts to the constant velocity tracts and thence to the deceleration tracts connect with seventh-degree polynomial curves.

Paragraph [0015] teaches the specifics necessary to make and use the invention and include teaching that the "theoretical law of motion, which exhibits the above-cited characteristics, becomes concrete motion with effective and determined velocity and acceleration values by means of a microprocessor which is connected to or integrated with the means for activating 4. To correctly define the law of motion at least five fundamental parameters are needed: the maximum run available for the cutting slide 2; the maximum acceleration that can be imposed on the

cutting slide 2; the length of the material to be cut; the maximum return velocity that can be imposed on the cutting slide 2. Starting from the above data, from the signal of an encoder detecting the velocity and the position of the material to be cut (tube or profile), and from the signal of an encoder which detects the velocity and position of a motor which accelerates the cutting slide 2, the microprocessor defines a law of motion in which the cut is made at the maximum possible line velocity."

"In particular, among the results obtained by the microprocessor, the value of the acceleration space of the outward run is very important, which coincides with the deceleration space of the return run. After the acceleration space there is the space during which the cutting slide 2 runs at a constant velocity and during which the cut is effected. This corresponds to the line speed multiplied by the cutting time. The outward run is terminated by the deceleration stage, which is followed by the return run, optimized for the end of the cycle i.e. the return run is terminated at exactly the moment at which a new outward run commences."

Paragraph [0016] Figure 2 illustrates the above by showing a graph evidencing the velocity, acceleration and jerk profiles relating to the curve of motion described. As can be seen the progresses of the three elements are continuous over time and are free of brusque variations."

In view of these teachings, applicant believes that one of skill could make and use the present invention.

Should there be any matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned at the telephone number listed below.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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